

Appln No. 09/722,088
Amdt. Dated October 23, 2003, 2003
Reply to Office action of July 23, 2003

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A sensing device for generating three-dimensional orientation data when positioned or moved relative to a surface, the orientation data being indicative of three dimensions of an orientation of the sensing device relative to the surface, the surface having coded data disposed upon it, the coded data being indicative, when sensed by the sensing device, of the orientation, the sensing device including:

a housing containing an orientation sensor and a transmitter;

the orientation sensor configured to generate the orientation data using at least some of the coded data, ~~the orientation data being indicative of at least one of a pitch and a roll of the housing relative to the surface;~~ and

the transmitter configured to transmit the orientation data to a computer system.

2. (Cancelled)

3. (Previously Presented) A sensing device according to claim 1, further including a motion sensor for generating movement data when the sensing device is moved relative to the surface, the transmitter being configured to transmit the movement data to the computer system.

4. (Previously Presented) A sensing device according to claim 3, further including a region identity sensor configured to sense, when the sensing device is positioned or moved relative to a region of the surface, and using at least some of the coded data, region identity data indicative of an identity of the region, the transmitter being configured to transmit the region identity data to the computer system.

5. (Previously Presented) A sensing device according to claim 4, wherein the motion sensor is configured to generate the movement data using at least some of the coded data.

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6. (Currently Amended) A sensing device according to claim 5, wherein the coded data is also indicative of a plurality of reference points of the region, each reference point being a two-dimensional co-ordinate position on the surface, the motion sensor being configured to generate the movement data on the basis of the sensing device's movement relative to at least one of the reference points.

7. (Currently Amended) A sensing device according to claim 5, wherein the coded data includes periodic elements, the periodic elements being substantially identical marks within the coded data which assist the sensing device in locating the coded data, the motion sensor being configured to generate the movement data on the basis of the sensing device's movement relative to at least one of the periodic elements.

8. (Previously Presented) A sensing device according to claims 6 or 7, wherein the motion sensor is configured to sample the position of the sensing device relative to the at least one reference point or periodic element, thereby to generate the movement data.

9. (Previously Presented) A sensing device according to claim 8, further including a distance estimator configured to estimate a distance of the sensing device from the at least one reference point or periodic element.

10. (Previously Presented) A sensing device according to claim 9, wherein the transmitter is configured to transmit distance data to the computer system, the distance data being indicative of the distance.

11. (Presently Presented) A sensing device according to claim 9, wherein the motion sensing means is configured to use the distance estimated by the distance estimator to resolve a more accurate position of the sensing device than indicated by the at least one reference point or periodic element alone.

12. (Cancelled)

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13. (Cancelled).

14. (Previously Presented) A sensing device according to claim 3, wherein the movement sensor includes at least one acceleration sensor, the acceleration sensor being configured to sense acceleration of the sensing device as it is moved relative to the surface, the movement sensing means being configured to generate the movement data by periodically sampling the acceleration.

15. (Previously Presented) A sensing device according to claim 14, wherein the acceleration sensor is configured to sense at least two substantially orthogonal components of acceleration.

Blat 16. (Previously Presented) A sensing device according to claim 4, further including a timer configured to generate a time reference as the sensing device is moved relative to the surface region.

17. (Previously Presented) A sensing device according to claim 16, wherein the transmitter is configured to transmit time reference data to the computer system, the time reference data being indicative of the time reference of the movement data as generated by the timer.

18. (Previously Presented) A sensing device according to claim 1, wherein the transmitter is a wireless transmitter.

19. (Previously Presented) A sensing device according to claim 1, further including a force sensor configured to sense a force applied to the surface by the sensing device.

20. (Previously Presented) A sensing device according to claim 19, wherein the transmitter is configured to transmit force data to the computer system, the force data being

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indicative of the force applied to the surface by the sensing device.

21. (Previously Presented) A sensing device according to claim 19, further including a stroke detector configured to detect, by way of the force, when the sensing device is applied to the surface and removed from the surface, thereby to identify the duration of a stroke.

22. (Previously Presented) A sensing device according to claim 1, further including a marking nib for marking the surface.

23. (Original) A sensing device according to claim 22, wherein the sensing device is in the form of a stylus or pen.

24. (Previously Presented) A sensing device according to claim 1, wherein the coded data is substantially invisible to the average unaided human eye.

25. (Original) A sensing device according to claim 24, wherein the coded data is printed using infrared ink, the sensing device being responsive in the infrared spectrum.

26. (Original) A sensing device according to claim 6, wherein the coded data includes a plurality of tags, each of which is indicative of an identity of a region within which the tag lies, and of a reference point of the region, the region being associated with the surface, the reference point being indicative of the position of the tag within the region.

27. (Original) A sensing device according to claim 7, wherein the coded data includes a plurality of tags, each of which is indicative of an identity of a region within which the tag lies, and each of which includes at least one periodic element of the coded data.

28. (Previously Presented) A sensing device according to claim 1, wherein the orientation sensor is configured to infer the orientation from perspective distortion of at least some of the coded data.

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29. (Cancelled)

30. (Cancelled)